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CLAIMS

- 5 1. Use of prokaryotic beta recombinase and its specific target sequences in eukaryotic cells.
 - 2. Use of prokaryotic beta recombinase for transgenic work in eukaryotic cells.
- 3. Use according to claim 1 or 2 for controlling gene expression in eukaryots.
 - 4. Use according to claim 1 or 2 for manipulating plant genomes in the generation of transgenic plants.
- 15 5. Use according to claim 1 of 2 in which the eukaryotic cells are mammalian cells.
 - 6. Use according to claim 1 or 2 for manipulating pathogenic and Gram positive bacteria.
- 7. Use according to any of the previous claim for site-specific intramolecular recombination between two six sites in eukaryotic cells.
 - 8. Use according to claim 7 for promotion of two or more different specific recombination events at a time.
 - 9. Use according to claim 7 for mediating exclusively intramolecular reactions.
 - 10. Use according to claim 7 in which the prokaryotic beta recombinase promotes the deletion of DNA sequences located between directly oriented six sites in mammalian cells.

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- 11. Use according to claim 7 in which the prokaryotic beta recombinase promotes the inversion of DNA sequences located between inverted repeated six sites in mammalian cells.
- 5 12. Use according to claim 10 in which the prokaryotic beta recombinase promotes deletion of a DNA fragment laying between two directly oriented six sites.
 - 13. Use according to claim 12 in which the prokaryotic beta recombinase promotes inversion of a DNA fragment laying between two inversely oriented six sites.
 - 14. Use according to claim 13 in which the prokaryotic beta recombinase promotes deletion of a DNA fragment laying between direct repeat specific recognition sequences.
- 15. Use according to claim 13 in which the prokaryotic beta recombinase promotes inversion of a DNA fragment laying between inverted repeated specific recognition sequences.
 - 16. Use according to claim 10, 11, 12 or 13 in which the specific recognition sequence is located as an extrachromosomal DNA substrate.
 - 17. Use of the gene coding for beta recombinase for catalysing site-specific resolution of DNA sequences in an extrachromosomal target introduced into an eukaryotic cell.
 - 18. Use of the gene according to claim 17 for catalysing site-specific resolution of DNA sequences when extrachromosomal target is a plasmid.
- 19. Use of the gene according to claim 17 or 18 in which the introduction is made by transfection.

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- 20. Use of the gene according to any of claims 17-to 19 in which the resolution means deletion.
- 21. Use of the gene according to any of claims 17 to 19 in which the resolution means inversion.
- 22. Use of the gene according to any of claims 17 to 21 in which the DNA sequences are allocated between the six sites.
- 23. Use of the gene according to any of claims 17 to 22 when the six sites are integrated in the genome as chromatin associated structures.
 - 24. Use of the gene according to any of claims 17 to 22 when the six sites are integrated in the genome and wrapped on a nucleosome, at several locations.
 - 25. Use according to claim 1 to develop new techniques for gene delivery in human gene therapy.
 - 26. Method for development of transgenic animals which includes the use of beta recombinase according to any of claims 4-21.

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